PORSF
11.3.30
05/31/2005

DRAFT

PGE-HARBORTON
CSM Site Summary

PGE-HARBORTON

Oregon DEQ ECSI #: 2353

12500 NW Marina Way
DEQ Site Mgr: Rod Struck
Latitude: 45.6136°
Longitude: -122.7968°
Township/Range/Section: 2N/1W/34

River Mile: 3.3 West bank

LWG Member ☐ Yes ☒ No

Upland Analytical Data Status: ☐ Electronic Data Available ☒ Hardcopies only

1. SUMMARY OF POTENTIAL CONTAMINANT TRANSPORT PATHWAYS TO THE RIVER

The current understanding of the transport mechanism of contaminants from the uplands portions of the Portland General Electric Company-Harborton (PGE-Harborton) site to the river is summarized in this section and Table 1, and supported in following sections.

1.1. Overland Transport

Minimal overland transport of contaminants via soil erosion is expected to occur at this site. The property can be roughly divided into developed and undeveloped sections. The undeveloped portion of the site (roughly the northern portion of the property) is largely covered with vegetation, and erosion of the soil to the river is therefore limited. The developed portion of the site is surrounded by a constructed perimeter dike. This perimeter dike restricts soil erosion and overland transport of contaminated soils to the river (Bridgewater 2002).

1.2. Riverbank Erosion

No historical records or visual evidence of dumping or filling along the riverbank have been identified during site investigations of this area. Both natural topographic features and constructed berms largely contain operational areas at the facility. No contamination of riverbank sediment is likely due to these controls (Bridgewater 2002).

1.3. Groundwater

Shallow groundwater is present beneath the site and flows toward the Willamette River. Initial investigations resulted in detections of TPH and PAHs. No detections of these constituents have been reported in the most recent sampling. The EPA concurs with the DEQ that the site is not a current source of groundwater contamination to the Willamette River (EPA 2004, pers. comm.). According to DEQ's (2005) Source Control Decision spreadsheet, a *No Further Action* status for the uplands is pending.

1.4. Direct Discharge (Overwater Activities and Stormwater/Wastewater Systems)

There are no overwater structures or operations at the PGE-Harborton site.

The perimeter dike prevents uncontrolled stormwater runoff from reaching the Willamette River. Stormwater in the flat areas of the site infiltrates the sand and silt fill materials placed inside the perimeter dike. Rainfall that collects in the clay-lined areas pools until it evaporates or is manually drained to the swale that runs along the southeastern side of the dike. Stormwater in the remaining undeveloped areas drains to the northwest into the undeveloped, low-lying area inside the dike. Areas outside of the dike drain toward the wetlands along the Multnomah Channel or down the swale to the Willamette (Bridgewater 2002).

1.5. Relationship of Upland Sources to River Sediments

See Final CSM Update.

1.6. Sediment Transport

The Portland General Electric Harborton Substation is on the west river bank where the Multnomah Channel intersects with the Lower Willamette. This portion of the river was characterized in the Portland Harbor Work Plan (Integral et al. 2004) as transitional between the upstream transport zone (RM 5-7) and the downstream depositional zone (RM 1-3) where the river broadens and bends towards the Columbia. The Sediment Trend Analysis® results indicate an upstream area of dynamic equilibrium transitions to a reach that experiences episodic net accretion and net erosion offshore of the General Electric property. Time-series bathymetric change data over the 25-month period from January 2002 through February 2004 (Integral and DEA 2004) for this area show mostly small-scale net erosion above the –20 ft depth contour (NAVD88) which transitions to small-scale accretion well offshore in the main channel. There is a shallow, gently sloping wide bench above the 0 depth contour (NAVD88) for which there is no bathymetric change data due to limited survey vessel access.

Periodic sediment stake monitoring was conducted along the beach at this site at elevations of +7, +9, and +15 ft (NAVD88) from July 2002 to November 2003. The lowest stake (+7) showed small (less than 5 cm) elevation losses (Anchor 2004) over this period and this is consistent with net erosion pattern seen just offshore. The mid-beach stake (+ 9) showed slight accretion through December 2002 and then some erosion (9 cm) between March and July 2003. The high stake (+15) also showed slight accretion through December 2002 and was reported missing thereafter (Anchor 2004).

2. CSM SITE SUMMARY REVISIONS

Date of Last Revision: May 31, 2005

3. PROJECT STATUS

Activity		Date(s)/Comments
PA/XPA	☐	
RI	☒	Pre-RI sampling activities conducted in Oct. 2000
FS	☐	
Interim Action/Source Control	☐	
ROD	☐	
RD/RA	☐	
NFA	☒	NFA for the uplands is pending

DEQ Portland Harbor Site Ranking (Tier 1, 2, or 3): Tier 3

4. SITE OWNER HISTORY

Owner/Occupant	Type of Operation	Years
Portland General Electric Company – **owner/operator**	Electrical switchyard, radio communication station, turbine power plant, two distillate fuel tanks, and storage of new and surplus equipment	1968 - present
Columbia Petroleum Co. - **operator**	Leased two ASTs intending to upgrade (tanks reportedly never upgraded)	1991 - ?
Olympic Pipe Line Company – **owner/operator**	Easement for oil/gas pipelines that traverse property	1964 - present
Peninsula Agencies, Inc. - **owner**	Unknown	1960 to 1968
(b) (6) [redacted] - **owner**	Unknown	1951 to 1968
Peninsula Mortgage - **owner**	Unknown	Sept. 1951 to Oct. 1951
Multnomah County - **owner**	Unknown	1942 to 1951

5. PROPERTY DESCRIPTION

The PGE-Harborton site is an industrial site encompassing approximately 77 acres on the northwestern bank of the Willamette River at approximately RM 3.3 (Figure 1). The site lies in an area zoned for mixed industrial, commercial, residential, and recreational uses. Wetland areas adjacent to the Multnomah Channel border the property to the northwest. South of the site are electrical power line right of ways and industrial property. Marina Way, railroad tracks, and Highway 30 are located to the west of the site.

Topographically, the site is generally flat, and surrounded on three sides by wetland areas and the Willamette River, as shown in Supplemental Figure 2 from Bridgewater (2002). Flood Insurance Maps show that the site is located within the 100-year floodplain. The site is divided into five general areas. The first area is a flat, but elevated portion that contains the distribution substation, switchyard, equipment storage yards (east and west), utility power pole storage yard, and rail car unloading area. The second area is a bermed, clay-lined containment for two former ASTs, which are now used for electrical equipment storage. The former fuel station is also located here. The third area is located southwest of the first area and consists of an open, low-lying, undeveloped portion of the site. A perimeter berm or dike surrounds the first three areas. The fourth area is located northwest of the perimeter dike and encompasses a second, undeveloped, low-lying area. A drainage swale constitutes the fifth area, and it extends along the southeast side of the perimeter dike (Bridgewater 2002).

The improved portions of the site (63 acres within the perimeter berm) are zoned by the City of Portland as Heavy Industrial. The natural area outside the berm (approximately 10.8 acres) is zoned Open Space, with a natural river greenway overlay zone. The area that contains the transmission towers is also zoned Heavy Industrial (Bridgewater 2000).

There are no ponds, surface impoundments, landfills, waste piles, or disposal areas on the site. No drainfields, dry wells, water supply wells, or USTs are found on the property. A rail tank car unloading terminal and associated distillate storage tanks are still present at the site, but have not been used since the mid-1980s.

The perimeter dike prevents uncontrolled stormwater runoff from reaching the Willamette River. Stormwater in the flat areas of the site infiltrates the sand and silt fill materials placed inside the perimeter dike. Rainfall that collects in the clay-lined areas pools until it evaporates or is manually drained to the swale that runs along the southeastern side of the dike. Stormwater in the remaining undeveloped areas drains to the northwest into the undeveloped, low-lying area inside the dike. Areas outside of the dike drain toward the wetlands along the Multnomah Channel or down the swale to the

Willamette (Bridgewater 2002).

According to ownership research on this property performed by the LWG, PGE leased 122.05 acres of submerged lands beginning in August 1976, but it is unclear if these lands are currently leased by PGE.

6. CURRENT SITE USE

Information provided in this section was obtained from Bridgewater (2000, 2002). The Harborton Substation Facility currently consists of an operating 115-KV switchyard and distribution substation, electrical equipment storage yards, a utility pole storage yard, and maintenance building. The property is used for electrical power regulation and transmission, electrical component storage, general equipment storage, treated wood pole storage, and formerly for power generation. The wood poles are treated with pentachlorophenol by an offsite contractor, and only a minimum inventory for emergency use is maintained at the facility. The pole storage area is located nearly 1,000 feet from the river in the westernmost corner of the site inside the perimeter containment berm (Bridgewater 1999).

The communications building and control house in the switchyard contain lead-acid power storage batteries. Some of the electrical equipment in the substation and switchyard contain mineral oil in quantities ranging from 55 to 6,483 gallons. Specifically, there is one 6,483-gallon liquid-filled transformer, and three oil-filled breakers ranging in size from 55 to 76 gallons. Since 1996, a small (30-foot by 60-foot) structure built for maintenance of the turbine power plant has been used to store capacitors containing PCBs. The capacitors are stored for no longer than 12 months.

There is an oily water filtration system adjacent to the maintenance building where oily-water collected from offsite electrical vaults is directed to an 800-gallon settling tank. Oil is removed from the surface by filling the tank with water and collecting the overflowing oil in drums. Remaining water is passed through a charcoal filter, tested for PCBs, and then put into the City's sewer system following approval from the City's Environmental Services department. A vendor transports the filtered water to the PGE maintenance facility located at 3700 SE 17th Avenue, in Portland where there is a sanitary sewer manhole for disposal. Approximately 4,000 gallons of water are filtered and disposed of each year. Approximately 100 gallons of oil is recovered in this process each year.

Olympic Pipe Line Company was granted an easement in 1964 to route oil and gas pipelines across the PGE-Harborton property, which are currently operating.

7. SITE USE HISTORY

Information provided in this section was obtained from Bridgewater (2000, 2002). PGE's tenure on the property began in 1968, when PGE exercised an option from 1967 and purchased the undeveloped 77+ acre site from Peninsula Agencies, Inc. From 1969 to 1971, PGE completed land-clearing activities for the planned Harborton Gas Turbine Generating Plant and constructed the Harborton-Rivergate overhead 230-KV transmission line across the Willamette River along the southern property line. Aerial photographs from 1956, 1961, 1968, and 1971 show extensive log raft moorage along the PGE shoreline as well as upriver. Evidence of the dense network of wooden pilings used during this time still exist offshore of the PGE-Harborton site. An electrical switchyard and radio communications station were constructed in 1972. The turbine power plant was completed in 1973.

Natural gas was the primary fuel for the four gas turbine generators; distillate fuel (No. 2 diesel) was used as backup. The diesel fuel was contained in two 100,000-gallon ASTs. PGE also constructed a 14-inch-diameter pipeline extending from the fuel pump station across the southern portion of the site to the newly developed Georgia Pacific (GP) chip terminal pier so distillate fuel could also be obtained by vessel. By the end of 1979, PGE no longer operated its turbines with natural gas, and by 1980, PGE terminated the gas turbine operation altogether. The turbines were sold and removed from the property in 1985. The remaining fuel inventory was also sold and routed through the 14-inch pipeline to the GP dock where it was loaded onto a fuel barge with U.S Coast Guard oversight. In 1988, the yard area and foundations of the former gas turbine plant were converted to a storage yard for new and used electrical equipment and components. The former ASTs were cleaned and refurbished as indoor storage areas.

Since 1988, the site has been used primarily as a storage yard for new and used electrical equipment and components. In 2000, PGE entered into a Voluntary Agreement with DEQ for a remedial investigation and source control measures. Limited soil removal actions have occurred on the site since PGE completed Phases I and II of its Pre-RI assessment.

8. CURRENT AND HISTORIC SOURCES AND COPCS

The understanding of historic and current potential upland sources at the site is summarized in Table 1. The following sections provide a brief overview of the potential sources and COPCs at the site requiring additional discussion.

8.1. Uplands

Subsurface soils in the area around MW-3 and MW-4 contain concentrations of PAHs above EPA Region 9 Preliminary Remediation Goals (PRGs) for industrial soils, but below Level II screening level values (Bridgewater 2002). These wells are located along the northwest side of the developed portion of the site, several hundred feet from the Willamette. The highest PAH concentrations were found at MW-4 in the interval just above the water table. According to Bridgewater (2002), these soils are limited in extent, and at MW-4 concentrations decrease in all directions laterally and vertically. The source of the PAHs is unknown but does not appear to be correlated with petroleum hydrocarbons. Nevertheless, these subsurface soils are likely a source of PAHs to shallow groundwater (Bridgewater 2002).

8.2. Overwater Activities

☐ Yes ☒ No

There are no over-water structures or operations at the PGE-Harborton site. According to ownership research on this property performed by the LWG, PGE leased 122.05 acres of submerged lands beginning in August 1976, but it is unclear if these lands are currently leased by PGE.

8.3. Spills

Known or documented spills at the PGE-Harborton site were obtained either from DEQ's Emergency Response Information System (ERIS) database for the period of 1995 to 2004, from oil and chemical spills recorded from 1982 to 2003 by the U.S. Coast Guard and the National Response Center's centralized federal database [see Appendix E of the Portland Harbor Work Plan (Integral et al. 2004)], from facility-specific technical reports, or from DEQ correspondence. These spills are summarized below.

Date	Material(s) Released	Volume Spilled (gallons)	Spill Surface (gravel, asphalt, sewer)	Action Taken (yes/no)
5/30/86[1]	Diesel fuel	1	Pump skid area adjacent to the ASTs	no
5/20/88	PCB transformer oil	20	Gravel	Cleaned up by PGE crew
2/9/95	Oil	5	Gravel	Cleaned up by PGE crew
2/24/97	PCB transformer oil	20	Gravel	Cleaned up by PGE crew
7/25/97	PCB oil	3	Gravel	Cleaned up by PGE crew
12/4/97	Cable oil	40	Bare ground, outside substation	Cleaned up by PGE crew

[1]PGE recently re-investigated the event (Bridgewater 2000) and determined that no spill actually occurred.

9. PHYSICAL SITE SETTING

Information regarding the site-specific geology and hydrogeology of the site was obtained from the Pre-RI (Bridgewater 2002) and a geotechnical study completed before the installation of the turbine generator system (Dames and Moore 1972). The geotechnical borings were completed to a maximum depth of 130 feet bgs.

9.1. Geology

According to the Pre-RI report, sand and silt fill were hydraulically placed at the site in the early 1970s to depths ranging from 4 to 10 feet bgs. Along the northeastern portion of the site, a clay dike structure, constructed to contain dredged sand and silt fill materials hydraulically placed at the site, is present to a depth of 9 feet bgs. Recent fill is underlain to a depth of approximately 90 feet bgs by Quaternary deposits. The Quaternary deposits are primarily sand, although, approximately 7 feet of silt or silty sand are present in the southwestern portion of the site, and approximately 10 feet of clay and silt extend to a depth of approximately 20 feet bgs in the northeastern part of the site. Geotechnical borings at the site indicate that the top of the Troutdale Formation (coarse-grained facies) may be present at a depth of 90 feet bgs. Columbia River Basalt was not encountered in any of the geotechnical borings completed at the site, which extended to a maximum depth 130 feet bgs.

9.2. Hydrogeology

Shallow groundwater generally occurs within the sand fill at a depth of approximately 3 to 9 feet bgs. The fill containment dike appears to influence the groundwater flow direction toward the east and southeast. Shallow groundwater fluxes are likely low; the result of the presence of the containment dike structure. Groundwater fluxes to the river likely become greater below the fill dike structure, where sand is in contact with the river. The calculated horizontal gradient in the sand and silt fill material ranges from 0.001 to 0.003 foot/foot based on water level measurements collected during the April and October 2001 monitoring events.

10. NATURE AND EXTENT *(Current Understanding)*

The current understanding of the nature and extent of contamination for the uplands portions of the site is summarized in this section. When no data exist for a specific medium, a notation is made.

10.1. Soil

10.1.1. Upland Soil Investigations

☒ Yes ☐ No

In October and November 2000, Hahn and Associates (2001) collected 47 surface soil samples and 4 subsurface soil samples at the site [see Supplemental Figure 3 from Hahn and Associates (2001)]. As shown in the table below, petroleum hydrocarbons were detected in 19 surface soil samples at concentrations as high as 31,400 mg/kg (diesel-range hydrocarbons), and 1,380 mg/kg (oil-range hydrocarbons). Subsequent soil removal activities (see Section 11.1) on the site have reduced diesel-range hydrocarbon concentrations to a high of 1,070 mg/kg. Various.PAHs were detected in 19 of 20 soil samples selected for analysis. Only two samples (samples #43 and MW-4) contained PAHs at concentrations that exceeded PRGs (Hahn and Associates 2001). PCBs were detected in one sample (#4) at a concentration of 0.013 mg/kg, below the PRG of 1 mg/kg. Diuron was detected in 15 of 25 samples analyzed; all detected concentrations were below the PRG of 1,800 mg/kg for industrial sites.

Analyte	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)
Total Petroleum Hydrocarbons (TPH)		
Diesel-range TPH	29	31,400[a]
Oil-range TPH	55	1,380
Polycyclic Aromatic Hydrocarbons (PAHs)		
Total PAHs	0.86	164.8
Polychlorinated Biphenyls (PCBs)		
	ND	0.013
Diuron		
	<0.05	0.64

mg/kg = milligrams per kilogram (ppm)
[a] Prior to soil removal, 1,070 mg/kg after soil removal.

Hahn and Associates (2001) collected four subsurface samples during installation of groundwater monitoring wells in October 2000 [see Supplemental Figure 2 from Hahn and Associates (July 2001)]. Subsurface soils were collected from each of the drilled well borings just above the water table. Detected chemicals included TPH (diesel-range 41.6 to 75 mg/kg, oil-range 56.6 to 97 mg/kg) and PAHs (0.46 to 164.8 mg/kg).

10.1.2. Riverbank Samples ☐ Yes ☒ No

There are no bank soil data associated with this site. No historical records or visual evidence of dumping or filling along the riverbank have been identified during site investigations of this area. Both natural topographic features and constructed berms largely contain operational areas at the facility. No contamination of riverbank sediment is likely due to these controls.

10.1.3. Summary

Chemicals detected in upland soil samples include TPH, PAHs, PCBs, and diuron. Soils in areas with the highest detected concentrations of TPH (up to 31,400 mg/kg) have been removed and properly disposed of offsite (see Section 11.1).

Subsurface soils in the area around MW-3 and MW-4 contain concentrations of PAHs above EPA Region 9 Preliminary Remediation Goals (PRGs) for industrial soils, but below Level II screening level values (Bridgewater 2002). These wells are located along the northwest side of the developed portion of the site, several hundred feet from the Willamette. The highest PAH concentrations were found at MW-4 in the interval just above the water table. According to Bridgewater (2002), these soils are limited in extent, and at MW-4 concentrations decrease in all directions laterally and vertically. The source of the PAHs is unknown but does not appear to be correlated with petroleum hydrocarbons. Nevertheless, these subsurface soils are likely a source of PAHs to shallow groundwater (Bridgewater 2002).

10.2. Groundwater

10.2.1. Groundwater Investigations ☒ Yes ☐ No

The findings from groundwater investigation activities are summarized in the Phase I and II Pre-RI Results report (Bridgewater 2001) and the Pre-RI report (Bridgewater 2002). The site contains five groundwater monitoring wells [see Supplemental Figure 2 from

Hahn and Associates (July 2001)], four of which were installed in October 2000 as part of the Pre-RI monitoring efforts in order to determine groundwater elevations and quality downgradient from the switchyard, equipment storage-yards, distribution substation, and former AST area. A fifth groundwater monitoring well was installed in 2001 (not shown on figure). The wells penetrate the shallow water-bearing zone with the bottoms of the well screens less than 16 feet bgs.

The first groundwater sampling event occurred in October 2000. TPH was detected in one of the four wells (MW-3) at 424 µg/L. PAHs were detected in all four wells with total PAH concentrations ranging from 0.48 to 33.89 µg/L. Diuron and PCBs (constituents detected in soil) were also analyzed for and not detected. The latest sampling data indicate that concentrations of COIs have decreased to non-detectable levels in groundwater (Voss 2004, pers. comm.). EPA has concurred with DEQ that the site does not appear to be a current source of contamination to the Willamette River (EPA 2004, pers. comm.).

10.2.2. NAPL (Historic & Current) ☐ Yes ☒ No

No NAPL has been observed in groundwater at the site.

10.2.3. Dissolved Contaminant Plumes ☐ Yes ☒ No

TPH and PAHs were detected in groundwater in 2000. These constituents had decreased to non-detectable levels by 2004.

Plume Characterization Status ☒ Complete ☐ Incomplete

According to the DEQ, sufficient groundwater data have been collected at the site to assess potential groundwater discharge impacts to the Willamette River (DEQ 2004, pers. comm.).

Plume Extent

2004 groundwater analytical results indicate no groundwater plume currently exists at the site.

Min/Max Detections (Current situation)

No COIs were detected in groundwater during the latest monitoring event (Voss 2004, pers. comm.).

Current Plume Data

The most recent groundwater monitoring resulted in no detections of TPH and PAHs (Voss 2004, pers. comm.).

Preferential Pathways

Site investigation reports did not identifiy preferential pathways, However, no information has been presented regarding the depths of the utilities at the facility relative to the shallow groundwater table or if the utility and associated backfill may be a preferential pathway at the site

Downgradient Plume Monitoring Points (min/max detections)

Monitoring Wells MW-1 and MW-2 were installed on the bank above the river at the downstream and upstream ends of the property [Supplemental Figure 2 from Hahn and Assoc. (July 2001)]. The initial 2000 monitoring event at MW-1 resulted in 0.48 µg/L total PAHs, MW-2 was "dry." These and the other site wells had no detections of TPH and PAHs in 2004. The initial 2000 monitoring event at MW-1 resulted in 0.48 µg/L total PAHs.

Visual Seep Sample Data ☐ Yes ☒ No

A seep was identified in the southeast corner of the site (GSI 2003); however, available records indicate that seep samples have not been collected at this location.

Nearshore Porewater Data

No porewater data have been collected at the site.

Groundwater Plume Temporal Trend

Groundwater monitoring at the site over time indicates that concentrations of COIs have decreased to non-detectable levels in groundwater.

10.2.4. Summary

Five shallow monitoring wells have been installed at the site to characterize groundwater. Although diesel-range petroleum hydrocarbons have been detected in groundwater samples collected from the wells, the most recent analytical results indicate no detectable COIs in groundwater. EPA has concurred with DEQ that the site does not appear to be a current source of contamination to the Willamette River (EPA 2004, pers. comm.). A NFA for the uplands is pending (DEQ 2005).

10.3. Surface Water

10.3.1. Surface Water Investigation ☐ Yes ☒ No

The perimeter dike prevents uncontrolled stormwater runoff from reaching the Willamette River. Stormwater in the flat areas of the site infiltrates the sand and silt fill materials placed inside the perimeter dike. Rainfall collects in the clay-lined areas pools until it evaporates or is manually drained to the swale that runs along the southeastern side of the dike. Stormwater in the remaining undeveloped areas drains to the northwest into the undeveloped, low-lying area inside the dike. Areas outside of the dike drain toward the wetlands along the Multnomah Channel or down the swale to the Willamette (Bridgewater 2002). No surface water sampling is described in the documents reviewed.

10.3.2. General or Individual Stormwater Permit (Current or Past) ☐ Yes ☒ No

Do other non-stormwater wastes discharge to the system? ☐ Yes ☒ No

10.3.3. Stormwater Data ☐ Yes ☒ No

10.3.4. Catch Basin Solids Data ☐ Yes ☒ No

10.3.5. Wastewater Permit ☐ Yes ☒ No

10.3.6. Wastewater Data ☐ Yes ☒ No

10.3.7. Summary

No stormwater investigations or stormwater and wastewater permits were identified in the documents reviewed.

10.4. Sediment

10.4.1. River Sediment Data ☒ Yes ☐ No

Roy F. Weston, Inc. collected two shallow sediment samples (SD001 and SD003) and a deeper core composite sample (SD001A) adjacent to the PGE-Harborton facility during the 1997 Portland Harbor sediment investigation (Weston 1998).

In October 2002, LWG Round 1 sediment data were collected in the lower Willamette

River, including a beach sediment sample along the shoreline of PGE-Harborton. During Round 2, two core sediment samples were collected: one at the southern property line and another offshore from the distribution substation.

Results from the Weston and LWG Round 1 investigations are summarized in Table 2.

10.4.2. Summary

See Final CSM Update.

11. CLEANUP HISTORY AND SOURCE CONTROL MEASURES

11.1. Soil Cleanup/Source Control

Soil removals (removal volumes are unknown) have occurred at the following locations (Hahn and Associates 2001):

- Southeast of the substation in the area where the 12/97 cable oil spill occurred [see sample location #50 on Supplemental Figure 2 from Hahn and Assoc. (Jan 2001)]
- At the end of the railroad spur (see sample location #1)
- Beneath a breaker in the switch yard (see sample location #33)
- Beneath a union in the AST containment area (see sample location #43).

11.2. Groundwater Cleanup/Source Control

No groundwater source control activities have been conducted at the site.

11.3. Other

Additional information regarding any other types of cleanup or source control measures at PGE-Harborton was not available.

11.4. Potential for Recontamination from Upland Sources

See Final CSM Update.

12. BIBLIOGRAPHY / INFORMATION SOURCES

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Figures:

Tables:

Supplemental Figures:

integral consulting inc.

LWG Lower Willamette Group

Map Document: (C:\GIS\Projects\Portland_Harbor\LWG-Map-Projects\Conseptual_Site_Model\Sample_Locations_3rd_Group.mxd)
Plot Date: 05/26/2005

Areal Photo Date: October 2001.
Base Map features from Portland Metro's RLIS.

Outfall information contained on this map is accurate according to available records; however, the City of Portland makes no warranty, expressed or implied, as to the completeness or accuracy of the information published (updated March 2005).

Legend

- Outfalls
- Seep Photo Location (Not location of actual Seep)
- Selected ECSI Site Property Boundary
- Navigation Channel
- Docks & In-water Structures
- River Miles
- -35ft. Contour (NAVD 88)

Human Use Areas

- Dockside Worker
- Recreational Beach Use
- Transient

LWG Round 2 Proposed Sediment Samples

- Surface Sample Only
- Core & Surface Sample

0 125 250 500 Feet

DRAFT

DO NOT QUOTE OR CITE. This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Figure 1-Site Features
Portland Harbor RI/FS
Conceptual Site Model
Portland General Electric -
Harborton Substation
ECSI 2353

TABLES

PGE-HARBORTON #2353

Table 1. Potential Sources and Transport Pathways Assessment

Potential Sources	Media Impacted					COIs																Potential Complete Pathway				
						TPH			VOCs																	
Description of Potential Source	Surface Soil	Subsurface Soil	Groundwater	Catch Basin Solids	River Sediment	Gasoline-Range	Diesel - Range	Heavier - Range	Petroleum-Related (e.g. BTEX)	VOCs	Chlorinated VOCs	SVOCs	PAHs	Phthalates	Phenolics	Metals	PCBs	Herbicides and Pesticides	Dioxins/Furans	Butyltins	Diuron	Overland Transport	Groundwater	Direct Discharge - Overwater	Direct Discharge - Storm/Wastewater	Riverbank Erosion
Upland Areas																										
Pockets of subsurface soil contamination near monitoring wells	✓	✓	✓				✓	✓					✓													
Overwater Areas																										
Other Areas/Other Issues																										

Notes:

All information provided in this table is referenced in the site summaries. If information is not available or inconclusive, a ? may be used, as appropriate. No new information is provided in this table.

✓ = Source, COI are present or current or historic pathway is determined to be complete or potentially complete

? = There is not enough information to determine if source or COI is present or if pathway is complete.

Blank = Source, COI and historic and current pathways have been investigated and shown to be not present or incomplete

UST Underground storage tank
AST Above-ground storage tank
TPH Total petroleum hydrocarbons
VOCs Volatile organic compounds
SVOCs Semivolatile organic compounds
PAHs Polycyclic aromatic hydrocarbons
BTEX Benzene, toluene, ethylbenzene, and xylenes
PCBs Polychorinated biphenols

Table 2. Queried Sediment Chemistry Data.

Surface or Subsurface	Analyte	Number of Samples	Number Detected	% Detected	Detected Concentrations Minimum	Maximum	Mean	Median	95th	Detected and Nondetected Concentrations Minimum	Maximum	Mean	Median	95th
surface	Aroclor 1016 (ug/kg)	3	0	0						3.9 U	20 U	9.27	3.9 U	3.9 U
surface	Aroclor 1242 (ug/kg)	3	0	0						3.9 U	20 U	9.27	3.9 U	3.9 U
surface	Aroclor 1248 (ug/kg)	3	1	33.3	8	8	8	8	8	6.4 U	20 U	11.5	8	8
surface	Aroclor 1254 (ug/kg)	3	0	0						3.9 U	20 U	12.3	13 U	13 U
surface	Aroclor 1260 (ug/kg)	3	0	0						3.9 U	20 U	12.3	13 U	13 U
surface	Aroclor 1221 (ug/kg)	3	0	0						7.8 U	39 U	18.2	7.8 U	7.8 U
surface	Aroclor 1232 (ug/kg)	3	0	0						3.9 U	20 U	9.27	3.9 U	3.9 U
surface	Polychlorinated biphenyls (ug/kg)	3	1	33.3	8 A	8 A	8	8 A	8 A	8 A	39 UA	20	13 UA	13 UA
surface	Butyltin ion (ug/kg)	1	0	0						5.9 UJ	5.9 UJ	5.9	5.9 UJ	5.9 UJ
surface	Butyltin ion (ug/l)	1	0	0						0.06 U	0.06 U	0.06	0.06 U	0.06 U
surface	Dibutyltin ion (ug/kg)	1	0	0						5.9 UJ	5.9 UJ	5.9	5.9 UJ	5.9 UJ
surface	Dibutyltin ion (ug/l)	1	0	0						0.06 U	0.06 U	0.06	0.06 U	0.06 U
surface	Tributyltin ion (ug/kg)	1	1	100	18 J	18 J	18	18 J	18 J	18 J	18 J	18	18 J	18 J
surface	Tributyltin ion (ug/l)	1	1	100	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
surface	Tetrabutyltin (ug/kg)	1	0	0						0.59 UJ	0.59 UJ	0.59	0.59 UJ	0.59 UJ
surface	Tetrabutyltin (ug/l)	1	0	0						0.02 U	0.02 U	0.02	0.02 U	0.02 U
surface	Total solids (percent)	2	2	100	49.5	76.7	63.1	49.5	49.5	49.5	76.7	63.1	49.5	49.5
surface	Total organic carbon (percent)	4	4	100	0.31	1.8	1.2	1	1.7	0.31	1.8	1.2	1	1.7
surface	Gravel (percent)	4	4	100	0.04	1	0.55	0.18	0.98	0.04	1	0.55	0.18	0.98
surface	Sand (percent)	2	2	100	62.71	80.13	71.4	62.71	62.71	62.71	80.13	71.4	62.71	62.71
surface	Very coarse sand (percent)	2	2	100	0.4	0.7	0.55	0.4	0.4	0.4	0.7	0.55	0.4	0.4
surface	Coarse sand (percent)	2	2	100	2.46	4.18	3.32	2.46	2.46	2.46	4.18	3.32	2.46	2.46
surface	Medium sand (percent)	2	2	100	16.5	28.3	22.4	16.5	16.5	16.5	28.3	22.4	16.5	16.5
surface	Fine sand (percent)	2	2	100	11.5	41.7	26.6	11.5	11.5	11.5	41.7	26.6	11.5	11.5
surface	Very fine sand (percent)	2	2	100	10.5	19.1	14.8	10.5	10.5	10.5	19.1	14.8	10.5	10.5
surface	Fines (percent)	2	2	100	19.83	36.31	28.1	19.83	19.83	19.83	36.31	28.1	19.83	19.83
surface	Silt (percent)	2	2	100	16.09	31.2	23.6	16.09	16.09	16.09	31.2	23.6	16.09	16.09
surface	Coarse silt (percent)	2	2	100	5.17	15.5	10.3	5.17	5.17	5.17	15.5	10.3	5.17	5.17
surface	Medium silt (percent)	2	2	100	3.12	12.4	7.76	3.12	3.12	3.12	12.4	7.76	3.12	3.12
surface	Fine silt (percent)	2	2	100	3.12	7.82	5.47	3.12	3.12	3.12	7.82	5.47	3.12	3.12
surface	Very fine silt (percent)	2	2	100	1.34	5.77	3.56	1.34	1.34	1.34	5.77	3.56	1.34	1.34
surface	Clay (percent)	2	2	100	3.74	5.11	4.43	3.74	3.74	3.74	5.11	4.43	3.74	3.74
surface	8-9 Phi clay (percent)	2	2	100	0.82	2.88	1.85	0.82	0.82	0.82	2.88	1.85	0.82	0.82
surface	9-10 Phi clay (percent)	2	2	100	0.7	1.76	1.23	0.7	0.7	0.7	1.76	1.23	0.7	0.7
surface	>10 Phi clay (percent)	2	2	100	1.58	2.62	2.1	1.58	1.58	1.58	2.62	2.1	1.58	1.58
surface	Dalapon (ug/kg)	2	0	0						16 UJ	16 U	16	16 UJ	16 UJ
surface	Dicamba (ug/kg)	2	0	0						3.2 U	3.2 U	3.2	3.2 U	3.2 U
surface	MCPA (ug/kg)	2	0	0						3200 U	51000 U	27100	3200 U	3200 U
surface	Dichloroprop (ug/kg)	2	0	0						6.4 UJ	30 U	18.2	6.4 UJ	6.4 UJ
surface	2,4-D (ug/kg)	2	0	0						6.4 UJ	6.4 U	6.4	6.4 UJ	6.4 UJ
surface	Silvex (ug/kg)	2	0	0						1.6 UJ	6.9 U	4.25	1.6 UJ	1.6 UJ
surface	2,4,5-T (ug/kg)	2	0	0						1.6 UJ	8.8 U	5.2	1.6 UJ	1.6 UJ
surface	2,4-DB (ug/kg)	2	0	0						47 U	160 U	104	47 U	47 U

Table 2. Queried Sediment Chemistry Data.

Surface or Subsurface	Analyte	Number of Samples	Number Detected	% Detected	Detected Concentrations Minimum	Maximum	Mean	Median	95th	Detected and Nondetected Concentrations Minimum	Maximum	Mean	Median	95th
surface	Dinoseb (ug/kg)	2	0	0						3.2 UJ	9.2 U	6.2	3.2 UJ	3.2 UJ
surface	MCPP (ug/kg)	2	0	0						3200 U	91000 U	47100	3200 U	3200 U
surface	Aluminum (mg/kg)	4	4	100	22100	29600	27000	28000	28300	22100	29600	27000	28000	28300
surface	Aluminum (mg/l)	1	1	100	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01
surface	Antimony (mg/kg)	2	0	0						4 UJ	4 UJ	4	4 UJ	4 UJ
surface	Antimony (mg/l)	1	0	0						0.05 U	0.05 U	0.05	0.05 U	0.05 U
surface	Arsenic (mg/kg)	4	4	100	2.7	5	3.73	3.2	4	2.7	5	3.73	3.2	4
surface	Arsenic (mg/l)	1	1	100	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
surface	Cadmium (mg/kg)	4	4	100	0.07	0.3	0.228	0.24	0.3	0.07	0.3	0.228	0.24	0.3
surface	Cadmium (mg/l)	1	0	0						0.002 U	0.002 U	0.002	0.002 U	0.002 U
surface	Chromium (mg/kg)	4	4	100	24 J	30	27.8	27.3	29.9	24 J	30	27.8	27.3	29.9
surface	Chromium (mg/l)	1	1	100	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
surface	Copper (mg/kg)	4	4	100	22.8	34.6	27.9	25.5	28.6	22.8	34.6	27.9	25.5	28.6
surface	Copper (mg/l)	1	1	100	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
surface	Lead (mg/kg)	4	4	100	11.3	15	13.1	12	14 J	11.3	15	13.1	12	14 J
surface	Lead (mg/l)	1	1	100	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
surface	Manganese (mg/kg)	2	2	100	460	515	488	460	460	460	515	488	460	460
surface	Manganese (mg/l)	1	1	100	0.887	0.887	0.887	0.887	0.887	0.887	0.887	0.887	0.887	0.887
surface	Mercury (mg/kg)	4	3	75	0.12 J	0.18 J	0.143	0.13	0.13	0.05 U	0.18 J	0.12	0.12 J	0.13
surface	Mercury (mg/l)	1	0	0						0.0001 U	0.0001 U	0.0001	0.0001 U	0.0001 U
surface	Nickel (mg/kg)	4	4	100	23 J	26.3	24.4	24	24.1	23 J	26.3	24.4	24	24.1
surface	Nickel (mg/l)	1	0	0						0.01 U	0.01 U	0.01	0.01 U	0.01 U
surface	Selenium (mg/kg)	4	2	50	11	12	11.5	11	11	0.3 UJ	12	5.93	0.4 U	11
surface	Selenium (mg/l)	1	0	0						0.001 U	0.001 U	0.001	0.001 U	0.001 U
surface	Silver (mg/kg)	4	3	75	0.07	0.6	0.39	0.5	0.5	0.03 UJ	0.6	0.3	0.07	0.5
surface	Silver (mg/l)	1	0	0						0.0002 U	0.0002 U	0.0002	0.0002 U	0.0002 U
surface	Thallium (mg/kg)	2	2	100	19	19	19	19	19	19	19	19	19	19
surface	Thallium (mg/l)	1	0	0						0.001 U	0.001 U	0.001	0.001 U	0.001 U
surface	Zinc (mg/kg)	4	4	100	73	106	96.3	100	106	73	106	96.3	100	106
surface	Zinc (mg/l)	1	1	100	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
surface	Barium (mg/kg)	2	2	100	155	170	163	155	155	155	170	163	155	155
surface	Barium (mg/l)	1	1	100	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055
surface	Beryllium (mg/kg)	2	2	100	0.48	0.51	0.495	0.48	0.48	0.48	0.51	0.495	0.48	0.48
surface	Beryllium (mg/l)	1	0	0						0.001 U	0.001 U	0.001	0.001 U	0.001 U
surface	Calcium (mg/kg)	2	2	100	7090	7720	7410	7090	7090	7090	7720	7410	7090	7090
surface	Calcium (mg/l)	1	1	100	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
surface	Cobalt (mg/kg)	2	2	100	16.4 J	16.4 J	16.4	16.4 J	16.4 J	16.4 J	16.4 J	16.4	16.4 J	16.4 J
surface	Cobalt (mg/l)	1	1	100	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
surface	Iron (mg/kg)	2	2	100	35400	35600	35500	35400	35400	35400	35600	35500	35400	35400
surface	Iron (mg/l)	1	1	100	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17	8.17
surface	Magnesium (mg/kg)	2	2	100	5290	5590	5440	5290	5290	5290	5590	5440	5290	5290
surface	Magnesium (mg/l)	1	1	100	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77
surface	Potassium (mg/kg)	2	2	100	980	1040	1010	980	980	980	1040	1010	980	980

Table 2. Queried Sediment Chemistry Data.

Surface or Subsurface	Analyte	Number of Samples	Number Detected	% Detected	Detected Concentrations Minimum	Maximum	Mean	Median	95th	Detected and Nondetected Concentrations Minimum	Maximum	Mean	Median	95th
surface	Potassium (mg/l)	1	1	100	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
surface	Sodium (mg/kg)	2	2	100	1050	1190	1120	1050	1050	1050	1190	1120	1050	1050
surface	Sodium (mg/l)	1	1	100	11	11	11	11	11	11	11	11	11	11
surface	Titanium (mg/kg)	1	1	100	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
surface	Vanadium (mg/kg)	2	2	100	82	83.6	82.8	82	82	82	83.6	82.8	82	82
surface	Vanadium (mg/l)	1	1	100	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
surface	2-Methylnaphthalene (ug/kg)	4	3	75	92	190	127	100	100	19 U	190	100	92	100
surface	Acenaphthene (ug/kg)	4	3	75	90	200	133	110	110	19 U	200	105	90	110
surface	Acenaphthylene (ug/kg)	4	3	75	72	170	114	100	100	19 U	170	90.3	72	100
surface	Anthracene (ug/kg)	4	3	75	130	250	193	200	200	19 U	250	150	130	200
surface	Fluorene (ug/kg)	4	3	75	76	170	119	110	110	19 U	170	93.8	76	110
surface	Naphthalene (ug/kg)	4	3	75	170	360	263	260	260	19 U	360	202	170	260
surface	Phenanthrene (ug/kg)	4	4	100	26	1300	764	630	1100	26	1300	764	630	1100
surface	Low Molecular Weight PAH (ug/kg)	4	4	100	26	2250	1380	1286 A	1962 A	26	2250	1380	1286 A	1962 A
surface	Dibenz(a,h)anthracene (ug/kg)	4	4	100	12 M	210 M	128	140	150	12 M	210 M	128	140	150
surface	Benz(a)anthracene (ug/kg)	4	4	100	38	940	597	570	840 J	38	940	597	570	840 J
surface	Benzo(a)pyrene (ug/kg)	4	4	100	53	1400 J	913	1100	1100	53	1400 J	913	1100	1100
surface	Benzo(b)fluoranthene (ug/kg)	4	4	100	32	1100 J	796	950	1100	32	1100 J	796	950	1100
surface	Benzo(g,h,i)perylene (ug/kg)	4	4	100	66	1200 J	639	580	710	66	1200 J	639	580	710
surface	Benzo(k)fluoranthene (ug/kg)	4	4	100	38	1100 J	577	540	630	38	1100 J	577	540	630
surface	Chrysene (ug/kg)	4	4	100	49	1200 J	777	760	1100	49	1200 J	777	760	1100
surface	Fluoranthene (ug/kg)	4	4	100	56	2500	1290	1100	1500	56	2500	1290	1100	1500
surface	Indeno(1,2,3-cd)pyrene (ug/kg)	4	4	100	46	1100 J	559	520	570	46	1100 J	559	520	570
surface	Pyrene (ug/kg)	4	4	100	83	2300	1320	1300	1600	83	2300	1320	1300	1600
surface	Benzo(b+k)fluoranthene (ug/kg)	2	2	100	1490 A	1730 A	1610	1490 A	1490 A	1490 A	1730 A	1610	1490 A	1490 A
surface	High Molecular Weight PAH (ug/kg)	4	4	100	473 M	11300 J	7610	7750 A	10910 A	473 M	11300 J	7610	7750 A	10910 A
surface	Polycyclic Aromatic Hydrocarbons (ug/kg)	2	2	100	9036 A	12872 A	11000	9036 A	9036 A	9036 A	12872 A	11000	9036 A	9036 A
surface	2,4'-DDD (ug/kg)	2	0	0						0.42 U	6 UJ	3.21	0.42 U	0.42 U
surface	2,4'-DDE (ug/kg)	2	0	0						0.86 U	13 U	6.93	0.86 U	0.86 U
surface	2,4'-DDT (ug/kg)	2	0	0						0.39 U	3.9 UJ	2.15	0.39 U	0.39 U
surface	4,4'-DDD (ug/kg)	3	2	66.7	5.8 J	16 J	10.9	5.8 J	5.8 J	0.39 U	16 J	7.4	5.8 J	5.8 J
surface	4,4'-DDE (ug/kg)	3	1	33.3	1.6 J	1.6 J	1.6	1.6 J	1.6 J	0.39 U	7.8 UJ	3.26	1.6 J	1.6 J
surface	4,4'-DDT (ug/kg)	3	1	33.3	88	88	88	88	88	0.39 U	88	30.1	2 U	2 U
surface	Total of 3 isomers: pp-DDT,-DDD,-DDE (ug/kg)	3	2	66.7	7.4 A	104	55.7	7.4 A	7.4 A	0.39 U	104	37.3	7.4 A	7.4 A
surface	Aldrin (ug/kg)	3	0	0						0.19 U	2 U	1.06	0.98 U	0.98 U
surface	alpha-Hexachlorocyclohexane (ug/kg)	3	0	0						0.19 U	2 U	1.06	0.98 UJ	0.98 UJ
surface	beta-Hexachlorocyclohexane (ug/kg)	3	0	0						0.19 U	2 U	1.06	0.98 U	0.98 U
surface	delta-Hexachlorocyclohexane (ug/kg)	3	0	0						0.19 U	2 UJ	1.4	2 UIJ	2 UIJ
surface	gamma-Hexachlorocyclohexane (ug/kg)	3	0	0						0.19 U	2 U	1.06	0.98 U	0.98 U
surface	cis-Chlordane (ug/kg)	3	0	0						0.19 U	2 U	1.06	0.98 U	0.98 U
surface	trans-Chlordane (ug/kg)	2	0	0						0.19 U	2 U	1.1	0.19 U	0.19 U
surface	Oxychlordane (ug/kg)	2	0	0						0.4 U	3.9 U	2.15	0.4 U	0.4 U
surface	cis-Nonachlor (ug/kg)	2	0	0						0.39 U	3.9 U	2.15	0.39 U	0.39 U

Table 2. Queried Sediment Chemistry Data.

Surface or Subsurface	Analyte	Number of Samples	Number Detected	% Detected	Detected Concentrations Minimum	Maximum	Mean	Median	95th	Detected and Nondetected Concentrations Minimum	Maximum	Mean	Median	95th
surface	trans-Nonachlor (ug/kg)	2	0	0						0.39 U	3.9 U	2.15	0.39 U	0.39 U
surface	Dieldrin (ug/kg)	3	0	0						0.39 U	3.9 U	2.1	2 U	2 U
surface	alpha-Endosulfan (ug/kg)	3	0	0						0.19 U	2 U	1.06	0.98 U	0.98 U
surface	beta-Endosulfan (ug/kg)	3	0	0						0.39 U	3.9 U	2.1	2 U	2 U
surface	Endosulfan sulfate (ug/kg)	3	0	0						0.39 U	3.9 U	2.1	2 U	2 U
surface	Endrin (ug/kg)	3	0	0						0.39 U	3.9 U	2.1	2 U	2 U
surface	Endrin aldehyde (ug/kg)	3	0	0						0.39 U	3.9 U	2.1	2 U	2 U
surface	Endrin ketone (ug/kg)	3	0	0						0.39 U	3.9 U	2.1	2 U	2 U
surface	Heptachlor (ug/kg)	3	0	0						0.19 U	2 U	1.06	0.98 U	0.98 U
surface	Heptachlor epoxide (ug/kg)	3	0	0						0.19 U	2 U	1.06	0.98 U	0.98 U
surface	Methoxychlor (ug/kg)	3	0	0						1.9 U	20 U	10.6	9.8 U	9.8 U
surface	Mirex (ug/kg)	2	0	0						0.39 U	3.9 U	2.15	0.39 U	0.39 U
surface	Toxaphene (ug/kg)	3	0	0						19 U	200 U	106	98 U	98 U
surface	gamma-Chlordane (ug/kg)	1	0	0						0.98 U	0.98 U	0.98	0.98 U	0.98 U
surface	2,3,4,6-Tetrachlorophenol (ug/kg)	2	0	0						96 U	97 U	96.5	96 U	96 U
surface	2,4,5-Trichlorophenol (ug/kg)	4	0	0						95 U	98 U	96.5	96 U	97 U
surface	2,4,6-Trichlorophenol (ug/kg)	4	0	0						95 U	98 U	96.5	96 U	97 U
surface	2,4-Dichlorophenol (ug/kg)	4	0	0						57 U	59 U	58	58 U	58 U
surface	2,4-Dimethylphenol (ug/kg)	4	0	0						19 U	58 U	38.8	20 U	58 U
surface	2,4-Dinitrophenol (ug/kg)	4	0	0						190 UJ	200 UJ	193	190 U	190 UJ
surface	2-Chlorophenol (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	2-Methylphenol (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	2-Nitrophenol (ug/kg)	4	0	0						95 U	98 U	96.5	96 U	97 U
surface	4,6-Dinitro-2-methylphenol (ug/kg)	4	0	0						190 UJ	200 UJ	193	190 U	190 UJ
surface	4-Chloro-3-methylphenol (ug/kg)	4	0	0						38 U	39 U	38.5	38 U	39 U
surface	4-Methylphenol (ug/kg)	4	3	75	23	73	39.7	23	23	19 U	73	34.5	23	23
surface	4-Nitrophenol (ug/kg)	4	0	0						95 U	98 U	96.5	96 UJ	97 U
surface	Pentachlorophenol (ug/kg)	4	1	25	110 J	110 J	110	110 J	110 J	9.6 U	110 J	61.7	29 U	98 UJ
surface	Phenol (ug/kg)	4	0	0						19 U	39 U	29	20 U	38 U
surface	2,3,4,5-Tetrachlorophenol (ug/kg)	2	0	0						96 U	97 U	96.5	96 U	96 U
surface	2,3,5,6-Tetrachlorophenol (ug/kg)	2	0	0						96 U	97 U	96.5	96 U	96 U
surface	Dimethyl phthalate (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	Diethyl phthalate (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	Dibutyl phthalate (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	Butylbenzyl phthalate (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	Di-n-octyl phthalate (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	Bis(2-ethylhexyl) phthalate (ug/kg)	4	2	50	45	150	97.5	45	45	45	150	74.3	46 UJ	56 UJ
surface	Azobenzene (ug/kg)	2	0	0						19 U	19 U	19	19 U	19 U
surface	Bis(2-chloro-1-methylethyl) ether (ug/kg)	4	0	0						19 UJ	20 UJ	19.3	19 U	19 U
surface	2,4-Dinitrotoluene (ug/kg)	4	0	0						95 U	98 U	96.5	96 U	97 U
surface	2,6-Dinitrotoluene (ug/kg)	4	0	0						95 U	98 U	96.5	96 U	97 U
surface	2-Chloronaphthalene (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	2-Nitroaniline (ug/kg)	4	0	0						95 U	98 U	96.5	96 U	97 U

Table 2. Queried Sediment Chemistry Data.

Surface or Subsurface	Analyte	Number of Samples	Number Detected	% Detected	Detected Concentrations Minimum	Maximum	Mean	Median	95th	Detected and Nondetected Concentrations Minimum	Maximum	Mean	Median	95th
surface	3,3'-Dichlorobenzidine (ug/kg)	4	0	0						95 U	98 U	96.5	96 UJ	97 U
surface	3-Nitroaniline (ug/kg)	4	0	0						110 UJ	120 U	118	120 UJ	120 U
surface	4-Bromophenyl phenyl ether (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	4-Chloroaniline (ug/kg)	4	0	0						57 U	59 U	58	58 U	58 U
surface	4-Chlorophenyl phenyl ether (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	4-Nitroaniline (ug/kg)	4	0	0						95 UJ	98 UJ	96.5	96 U	97 U
surface	Aniline (ug/kg)	2	0	0						19 U	19 U	19	19 U	19 U
surface	Benzoic acid (ug/kg)	4	0	0						190 U	200 U	193	190 U	190 U
surface	Benzyl alcohol (ug/kg)	4	0	0						19 UJ	97 U	58	20 UJ	96 U
surface	Bis(2-chloroethoxy) methane (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	Bis(2-chloroethyl) ether (ug/kg)	4	0	0						38 U	39 U	38.5	38 U	39 U
surface	Carbazole (ug/kg)	4	3	75	26	67 J	43.7	38 J	38 J	1.9 U	67 J	33.2	26	38 J
surface	Dibenzofuran (ug/kg)	4	3	75	20	36	27.7	27	27	1.9 U	36	21.2	20	27
surface	Hexachlorobenzene (ug/kg)	4	0	0						0.19 U	20 U	10.3	2 U	19 U
surface	Hexachlorobutadiene (ug/kg)	4	0	0						0.31 U	20 U	10.3	2 U	19 U
surface	Hexachlorocyclopentadiene (ug/kg)	4	0	0						95 UJ	98 UJ	96.5	96 U	97 UJ
surface	Hexachloroethane (ug/kg)	4	0	0						1.9 U	20 U	11.7	5.8 U	19 U
surface	Isophorone (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	Nitrobenzene (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	N-Nitrosodimethylamine (ug/kg)	2	0	0						96 U	97 U	96.5	96 U	96 U
surface	N-Nitrosodipropylamine (ug/kg)	4	0	0						38 U	39 UJ	38.5	38 U	39 U
surface	N-Nitrosodiphenylamine (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	1,2-Dichlorobenzene (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	1,3-Dichlorobenzene (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	1,4-Dichlorobenzene (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
surface	1,2,4-Trichlorobenzene (ug/kg)	4	0	0						19 U	20 U	19.3	19 U	19 U
subsurface	Aroclor 1016 (ug/kg)	1	0	0						19 UJ	19 UJ	19	19 UJ	19 UJ
subsurface	Aroclor 1242 (ug/kg)	1	0	0						19 UJ	19 UJ	19	19 UJ	19 UJ
subsurface	Aroclor 1248 (ug/kg)	1	0	0						19 UJ	19 UJ	19	19 UJ	19 UJ
subsurface	Aroclor 1254 (ug/kg)	1	0	0						19 UJ	19 UJ	19	19 UJ	19 UJ
subsurface	Aroclor 1260 (ug/kg)	1	0	0						19 UJ	19 UJ	19	19 UJ	19 UJ
subsurface	Aroclor 1221 (ug/kg)	1	0	0						39 UJ	39 UJ	39	39 UJ	39 UJ
subsurface	Aroclor 1232 (ug/kg)	1	0	0						19 UJ	19 UJ	19	19 UJ	19 UJ
subsurface	Polychlorinated biphenyls (ug/kg)	1	0	0						39 UA	39 UA	39	39 UA	39 UA
subsurface	Butyltin ion (ug/kg)	1	0	0						11 U	11 U	11	11 U	11 U
subsurface	Dibutyltin ion (ug/kg)	1	0	0						11 U	11 U	11	11 U	11 U
subsurface	Tributyltin ion (ug/kg)	1	0	0						11 U	11 U	11	11 U	11 U
subsurface	Tetrabutyltin (ug/kg)	1	0	0						11 U	11 U	11	11 U	11 U
subsurface	Total organic carbon (percent)	1	1	100	3	3	3	3	3	3	3	3	3	3
subsurface	Gravel (percent)	1	1	100	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
subsurface	Sand (percent)	1	1	100	22.38	22.38	22.4	22.38	22.38	22.38	22.38	22.4	22.38	22.38
subsurface	Fines (percent)	1	1	100	77.45	77.45	77.5	77.45	77.45	77.45	77.45	77.5	77.45	77.45
subsurface	Silt (percent)	1	1	100	60.09	60.09	60.1	60.09	60.09	60.09	60.09	60.1	60.09	60.09

Table 2. Queried Sediment Chemistry Data.

Surface or Subsurface	Analyte	Number of Samples	Number Detected	% Detected	Detected Concentrations Minimum	Maximum	Mean	Median	95th	Detected and Nondetected Concentrations Minimum	Maximum	Mean	Median	95th
subsurface	Clay (percent)	1	1	100	17.36	17.36	17.4	17.36	17.36	17.36	17.36	17.4	17.36	17.36
subsurface	Aluminum (mg/kg)	1	1	100	40300	40300	40300	40300	40300	40300	40300	40300	40300	40300
subsurface	Antimony (mg/kg)	1	1	100	5 J	5 J	5	5 J	5 J	5 J	5 J	5	5 J	5 J
subsurface	Arsenic (mg/kg)	1	0	0						5 U	5 U	5	5 U	5 U
subsurface	Cadmium (mg/kg)	1	1	100	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
subsurface	Chromium (mg/kg)	1	1	100	37.7	37.7	37.7	37.7	37.7	37.7	37.7	37.7	37.7	37.7
subsurface	Copper (mg/kg)	1	1	100	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4
subsurface	Lead (mg/kg)	1	1	100	27	27	27	27	27	27	27	27	27	27
subsurface	Manganese (mg/kg)	1	1	100	587	587	587	587	587	587	587	587	587	587
subsurface	Mercury (mg/kg)	1	1	100	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
subsurface	Nickel (mg/kg)	1	1	100	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6
subsurface	Selenium (mg/kg)	1	1	100	8	8	8	8	8	8	8	8	8	8
subsurface	Silver (mg/kg)	1	1	100	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
subsurface	Thallium (mg/kg)	1	0	0						5 U	5 U	5	5 U	5 U
subsurface	Zinc (mg/kg)	1	1	100	152	152	152	152	152	152	152	152	152	152
subsurface	Barium (mg/kg)	1	1	100	192	192	192	192	192	192	192	192	192	192
subsurface	Beryllium (mg/kg)	1	1	100	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
subsurface	Calcium (mg/kg)	1	1	100	8860	8860	8860	8860	8860	8860	8860	8860	8860	8860
subsurface	Cobalt (mg/kg)	1	1	100	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4
subsurface	Iron (mg/kg)	1	1	100	42100	42100	42100	42100	42100	42100	42100	42100	42100	42100
subsurface	Magnesium (mg/kg)	1	1	100	7150	7150	7150	7150	7150	7150	7150	7150	7150	7150
subsurface	Potassium (mg/kg)	1	1	100	1370	1370	1370	1370	1370	1370	1370	1370	1370	1370
subsurface	Sodium (mg/kg)	1	1	100	1150 J	1150 J	1150	1150 J	1150 J	1150 J	1150 J	1150	1150 J	1150 J
subsurface	Titanium (mg/kg)	1	1	100	1970	1970	1970	1970	1970	1970	1970	1970	1970	1970
subsurface	Vanadium (mg/kg)	1	1	100	103	103	103	103	103	103	103	103	103	103
subsurface	2-Methylnaphthalene (ug/kg)	1	1	100	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
subsurface	Acenaphthene (ug/kg)	1	1	100	4100	4100	4100	4100	4100	4100	4100	4100	4100	4100
subsurface	Acenaphthylene (ug/kg)	1	1	100	400	400	400	400	400	400	400	400	400	400
subsurface	Anthracene (ug/kg)	1	1	100	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
subsurface	Fluorene (ug/kg)	1	1	100	2600	2600	2600	2600	2600	2600	2600	2600	2600	2600
subsurface	Naphthalene (ug/kg)	1	1	100	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900
subsurface	Phenanthrene (ug/kg)	1	1	100	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000
subsurface	Low Molecular Weight PAH (ug/kg)	1	1	100	31000 A	31000 A	31000	31000 A	31000 A	31000 A	31000 A	31000	31000 A	31000 A
subsurface	Dibenz(a,h)anthracene (ug/kg)	1	1	100	830	830	830	830	830	830	830	830	830	830
subsurface	Benz(a)anthracene (ug/kg)	1	1	100	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
subsurface	Benzo(a)pyrene (ug/kg)	1	1	100	5700	5700	5700	5700	5700	5700	5700	5700	5700	5700
subsurface	Benzo(b)fluoranthene (ug/kg)	1	1	100	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200
subsurface	Benzo(g,h,i)perylene (ug/kg)	1	1	100	4600	4600	4600	4600	4600	4600	4600	4600	4600	4600
subsurface	Benzo(k)fluoranthene (ug/kg)	1	1	100	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900
subsurface	Chrysene (ug/kg)	1	1	100	5300	5300	5300	5300	5300	5300	5300	5300	5300	5300
subsurface	Fluoranthene (ug/kg)	1	1	100	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000
subsurface	Indeno(1,2,3-cd)pyrene (ug/kg)	1	1	100	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200
subsurface	Pyrene (ug/kg)	1	1	100	19000	19000	19000	19000	19000	19000	19000	19000	19000	19000

Table 2. Queried Sediment Chemistry Data.

Surface or Subsurface	Analyte	Number of Samples	Number Detected	% Detected	Detected Concentrations Minimum	Maximum	Mean	Median	95th	Detected and Nondetected Concentrations Minimum	Maximum	Mean	Median	95th
subsurface	Benzo(b+k)fluoranthene (ug/kg)	1	1	100	7100 A	7100 A	7100	7100 A	7100 A	7100 A	7100 A	7100	7100 A	7100 A
subsurface	High Molecular Weight PAH (ug/kg)	1	1	100	63930 A	63930 A	63900	63930 A	63930 A	63930 A	63930 A	63900	63930 A	63930 A
subsurface	Polycyclic Aromatic Hydrocarbons (ug/kg)	1	1	100	94930 A	94930 A	94900	94930 A	94930 A	94930 A	94930 A	94900	94930 A	94930 A
subsurface	4,4'-DDD (ug/kg)	1	1	100	36 J	36 J	36	36 J	36 J	36 J	36 J	36	36 J	36 J
subsurface	4,4'-DDE (ug/kg)	1	1	100	9.4 J	9.4 J	9.4	9.4 J	9.4 J	9.4 J	9.4 J	9.4	9.4 J	9.4 J
subsurface	4,4'-DDT (ug/kg)	1	1	100	62 J	62 J	62	62 J	62 J	62 J	62 J	62	62 J	62 J
subsurface	Total of 3 isomers: pp-DDT,-DDD,-DDE (ug/kg)	1	1	100	107.4 A	107.4 A	107	107.4 A	107.4 A	107.4 A	107.4 A	107	107.4 A	107.4 A
subsurface	Aldrin (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	alpha-Hexachlorocyclohexane (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	beta-Hexachlorocyclohexane (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	delta-Hexachlorocyclohexane (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	gamma-Hexachlorocyclohexane (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	cis-Chlordane (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	Dieldrin (ug/kg)	1	0	0						1.9 UJ	1.9 UJ	1.9	1.9 UJ	1.9 UJ
subsurface	alpha-Endosulfan (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	beta-Endosulfan (ug/kg)	1	0	0						1.9 UJ	1.9 UJ	1.9	1.9 UJ	1.9 UJ
subsurface	Endosulfan sulfate (ug/kg)	1	0	0						1.9 UJ	1.9 UJ	1.9	1.9 UJ	1.9 UJ
subsurface	Endrin (ug/kg)	1	0	0						1.9 UJ	1.9 UJ	1.9	1.9 UJ	1.9 UJ
subsurface	Endrin aldehyde (ug/kg)	1	0	0						1.9 UJ	1.9 UJ	1.9	1.9 UJ	1.9 UJ
subsurface	Endrin ketone (ug/kg)	1	0	0						1.9 UJ	1.9 UJ	1.9	1.9 UJ	1.9 UJ
subsurface	Heptachlor (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	Heptachlor epoxide (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	Methoxychlor (ug/kg)	1	0	0						9.6 UJ	9.6 UJ	9.6	9.6 UJ	9.6 UJ
subsurface	Toxaphene (ug/kg)	1	0	0						96 UJ	96 UJ	96	96 UJ	96 UJ
subsurface	gamma-Chlordane (ug/kg)	1	0	0						0.96 UJ	0.96 UJ	0.96	0.96 UJ	0.96 UJ
subsurface	2,4,5-Trichlorophenol (ug/kg)	1	0	0						370 U	370 U	370	370 U	370 U
subsurface	2,4,6-Trichlorophenol (ug/kg)	1	0	0						370 U	370 U	370	370 U	370 U
subsurface	2,4-Dichlorophenol (ug/kg)	1	0	0						220 U	220 U	220	220 U	220 U
subsurface	2,4-Dimethylphenol (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	2,4-Dinitrophenol (ug/kg)	1	0	0						730 UJ	730 UJ	730	730 UJ	730 UJ
subsurface	2-Chlorophenol (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	2-Methylphenol (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	2-Nitrophenol (ug/kg)	1	0	0						370 U	370 U	370	370 U	370 U
subsurface	4,6-Dinitro-2-methylphenol (ug/kg)	1	0	0						730 UJ	730 UJ	730	730 UJ	730 UJ
subsurface	4-Chloro-3-methylphenol (ug/kg)	1	0	0						150 U	150 U	150	150 U	150 U
subsurface	4-Methylphenol (ug/kg)	1	1	100	450	450	450	450	450	450	450	450	450	450
subsurface	4-Nitrophenol (ug/kg)	1	0	0						370 U	370 U	370	370 U	370 U
subsurface	Pentachlorophenol (ug/kg)	1	0	0						370 UJ	370 UJ	370	370 UJ	370 UJ
subsurface	Phenol (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Dimethyl phthalate (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Diethyl phthalate (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Dibutyl phthalate (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Butylbenzyl phthalate (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U

Table 2. Queried Sediment Chemistry Data.

Surface or Subsurface	Analyte	Number of Samples	Number Detected	% Detected	Detected Concentrations Minimum	Maximum	Mean	Median	95th	Detected and Nondetected Concentrations Minimum	Maximum	Mean	Median	95th
subsurface	Di-n-octyl phthalate (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Bis(2-ethylhexyl) phthalate (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Bis(2-chloro-1-methylethyl) ether (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	2,4-Dinitrotoluene (ug/kg)	1	0	0						370 U	370 U	370	370 U	370 U
subsurface	2,6-Dinitrotoluene (ug/kg)	1	0	0						370 U	370 U	370	370 U	370 U
subsurface	2-Chloronaphthalene (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	2-Nitroaniline (ug/kg)	1	0	0						370 U	370 U	370	370 U	370 U
subsurface	3,3'-Dichlorobenzidine (ug/kg)	1	0	0						370 U	370 U	370	370 U	370 U
subsurface	3-Nitroaniline (ug/kg)	1	0	0						440 UJ	440 UJ	440	440 UJ	440 UJ
subsurface	4-Bromophenyl phenyl ether (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	4-Chloroaniline (ug/kg)	1	0	0						220 U	220 U	220	220 U	220 U
subsurface	4-Chlorophenyl phenyl ether (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	4-Nitroaniline (ug/kg)	1	0	0						370 UJ	370 UJ	370	370 UJ	370 UJ
subsurface	Benzoic acid (ug/kg)	1	0	0						730 U	730 U	730	730 U	730 U
subsurface	Benzyl alcohol (ug/kg)	1	0	0						73 UJ	73 UJ	73	73 UJ	73 UJ
subsurface	Bis(2-chloroethoxy) methane (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Bis(2-chloroethyl) ether (ug/kg)	1	0	0						150 U	150 U	150	150 U	150 U
subsurface	Carbazole (ug/kg)	1	1	100	370 J	370 J	370	370 J	370 J	370 J	370 J	370	370 J	370 J
subsurface	Dibenzofuran (ug/kg)	1	1	100	290	290	290	290	290	290	290	290	290	290
subsurface	Hexachlorobenzene (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Hexachlorobutadiene (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Hexachlorocyclopentadiene (ug/kg)	1	0	0						370 UJ	370 UJ	370	370 UJ	370 UJ
subsurface	Hexachloroethane (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Isophorone (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	Nitrobenzene (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	N-Nitrosodipropylamine (ug/kg)	1	0	0						150 U	150 U	150	150 U	150 U
subsurface	N-Nitrosodiphenylamine (ug/kg)	1	0	0						73 UJ	73 UJ	73	73 UJ	73 UJ
subsurface	1,2-Dichlorobenzene (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	1,3-Dichlorobenzene (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	1,4-Dichlorobenzene (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U
subsurface	1,2,4-Trichlorobenzene (ug/kg)	1	0	0						73 U	73 U	73	73 U	73 U

SUPPLEMENTAL FIGURES

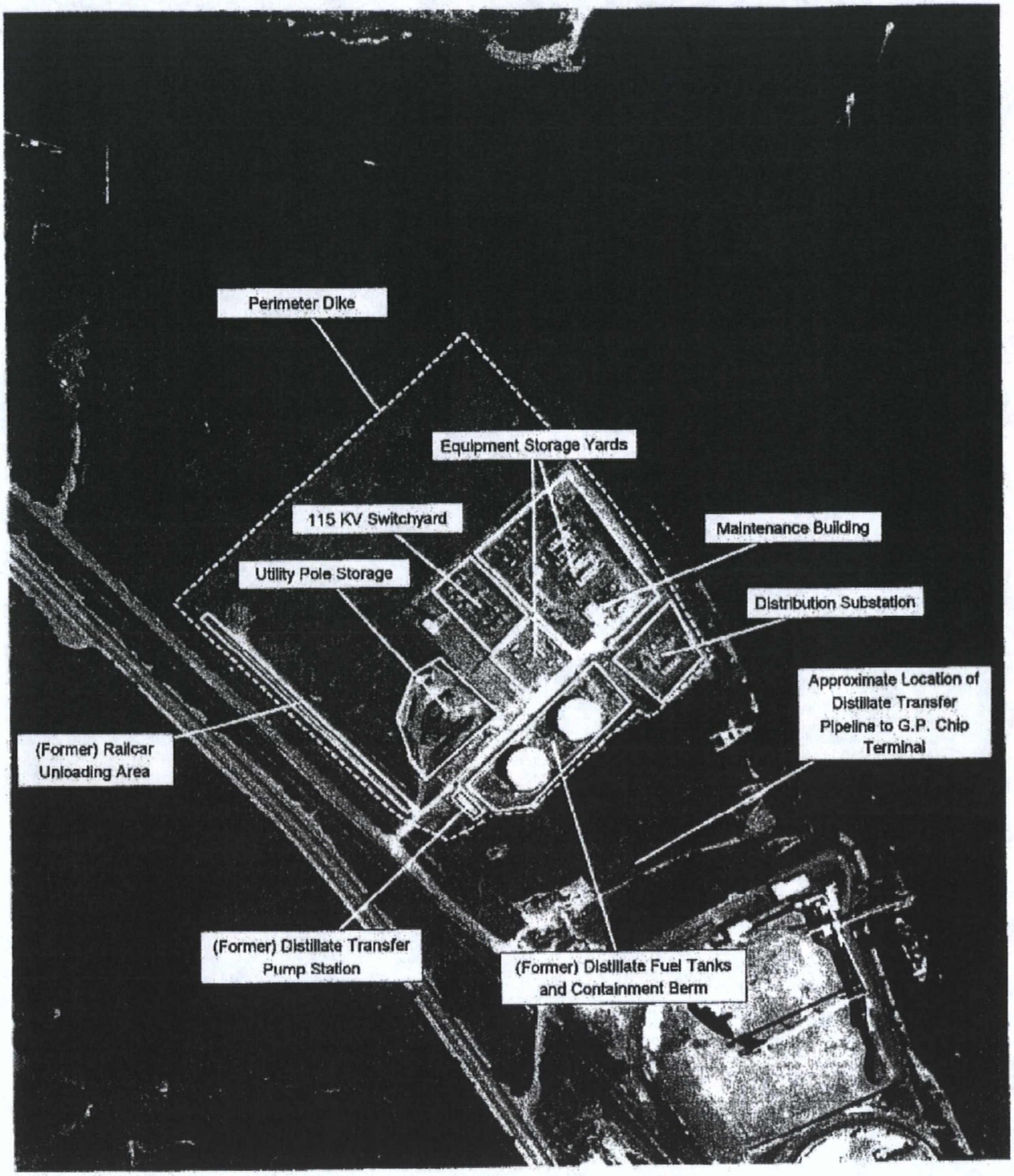

Figure 2
Harborton Site Features (July 29, 1998)
Harborton Substation Facility Pre-RI Assessment

Photo Source: Northern Lights Studio, Portland Oregon

BRIDGEWATER GROUP, INC.

/PGE/Harborton/Figures/000201_2.vsd

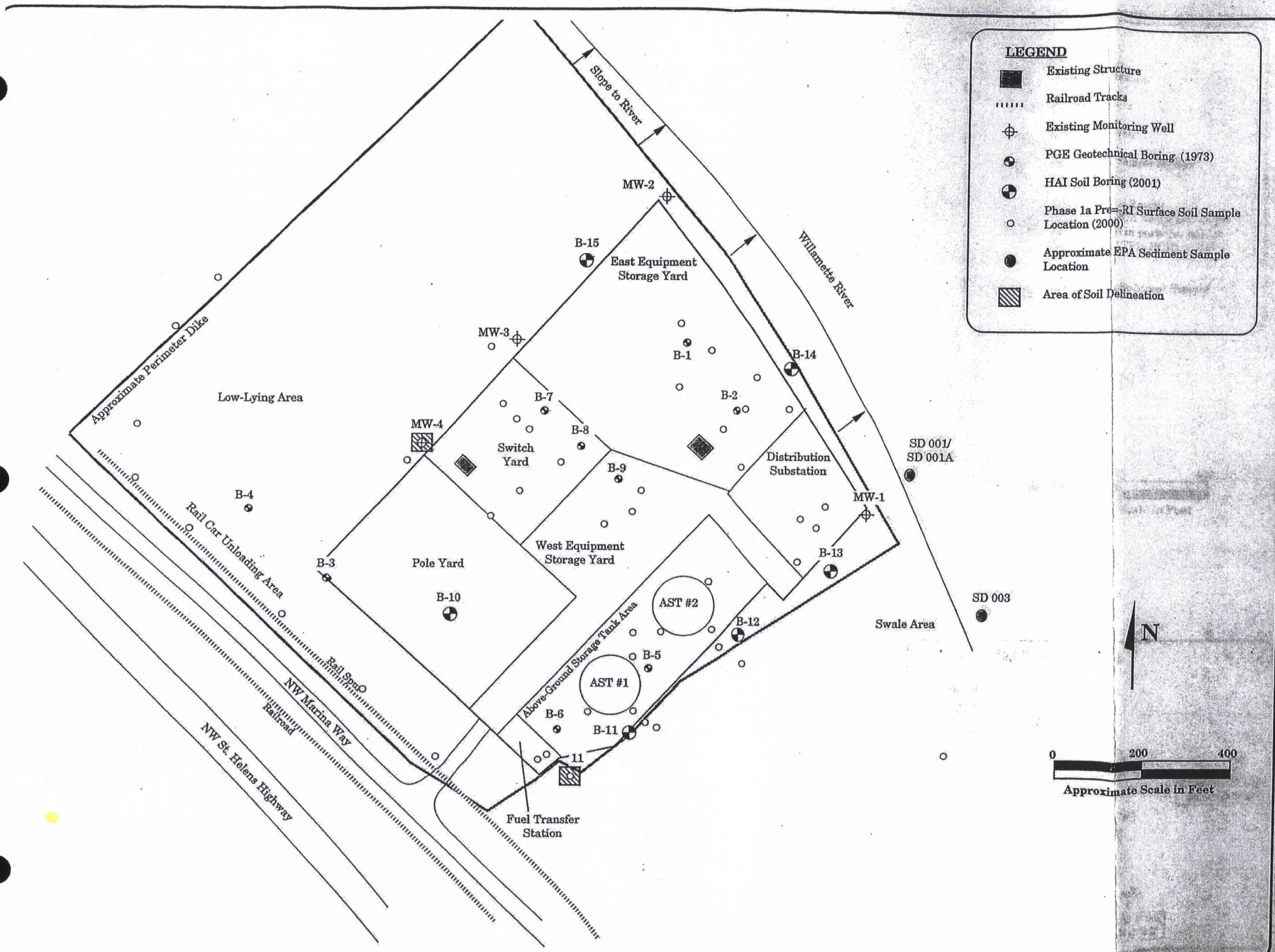

Figure 2

Site Map

Phase 2b Pre-RI Data Package
Portland General Electric Company
Harborton Substation Facility
NW Marina Way
Portland, Oregon

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
(503) 796-0717

July 2001

Project No.
4838

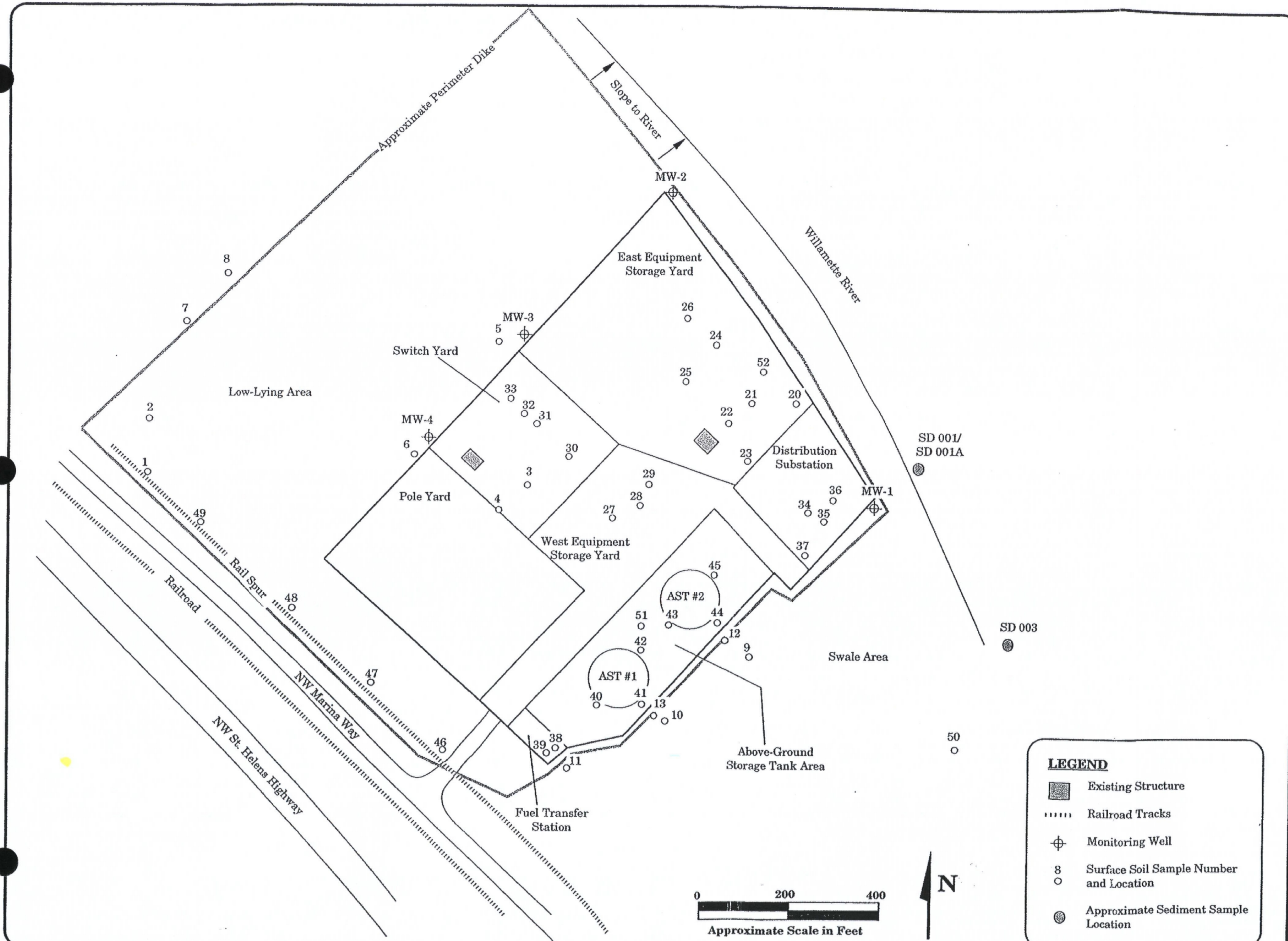

Figure 2

Site Map

Portland General Electric Company
Harborton Substation Facility
NW Marina Way
Portland, Oregon

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
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January 2001

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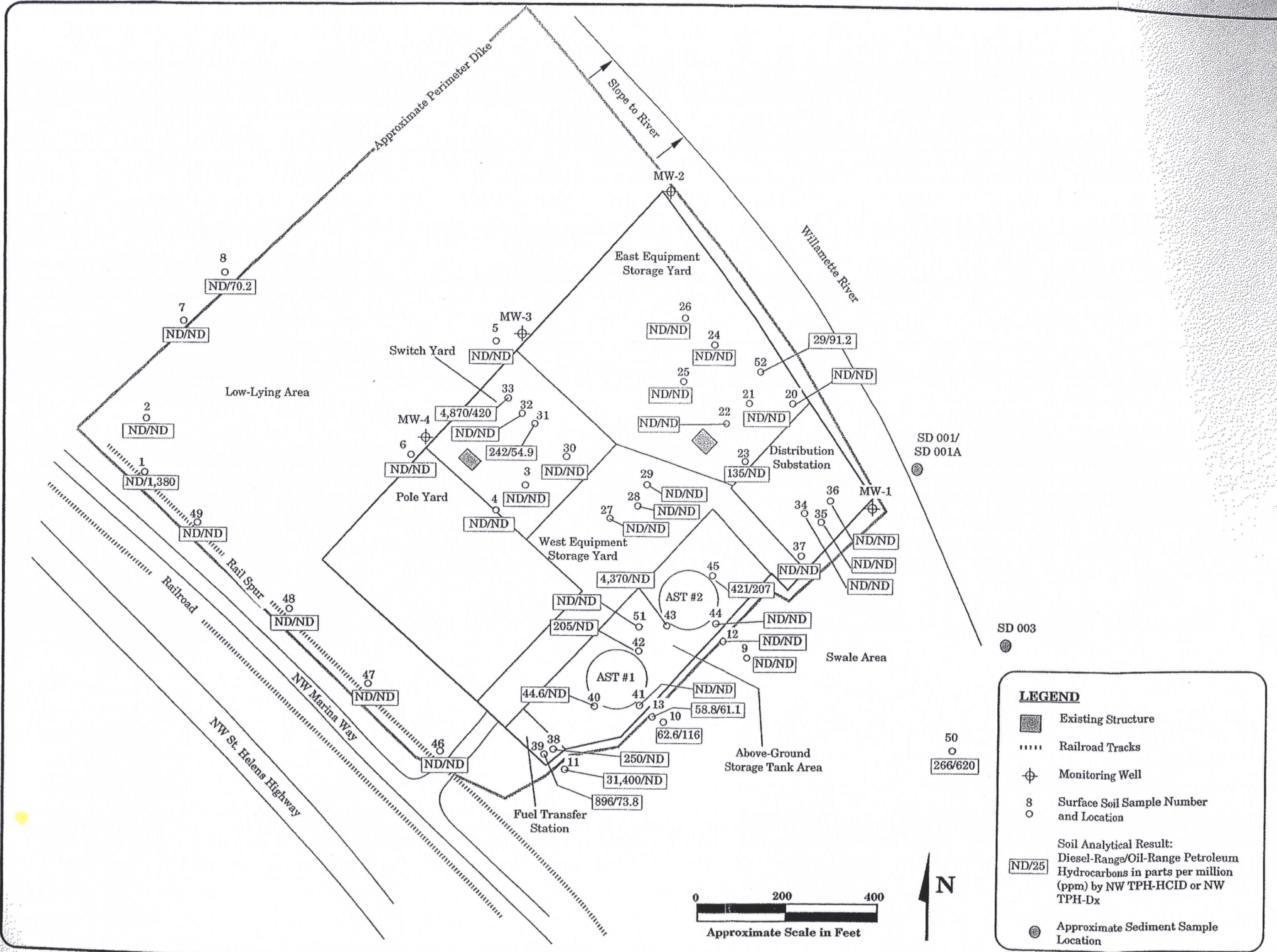

Figure 3

Total Petroleum Hydrocarbons In Surface Soil

Portland General Electric Company
Harborton Substation Facility
NW Marland Way
Portland, Oregon

HAHN AND ASSOCIATES, INC.
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January 2001

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